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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
ROBERTSON, DAVID	
ART UNIT	**PAPER NUMBER**
3623	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/098,615	ARONOWICH ET AL.	
	Examiner	Art Unit	
	Dave Robertson	3623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This is a Non-final office action following a Request for Continued Examination (RCE) over pending claims 1-32.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/13/2007 has been entered.

Response to Amendment

3. The specification is amended to address a minor objection raised with regard to a conflict between Applicant's Rule 1.105 statement on the provenance of a claimed equation and the written description. Accordingly, the objection is withdrawn.

Response to Arguments

4. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection. New grounds of rejection follow.

Claim Objections

5. Claims 1, 2, 4-7, 10, 12-15, 22 and 30 are objected to because of the following informalities:

Claim 1 has a typo at "comparing a sales value of the time series of salves values..."

Claims 4-7 refer to a step d) which is not in dependent claim 1, and in claim 1 there are no steps a) b) or c) preceding such a step d).

Claim 12 refers to the step d) of claim 9, however claim 9 has no step d). Referring to a step d) in claim 9 would also cure claims 13-15 depending from claim 9.

Claims 2, 10, 22, and 30 recite the formula

$$H = \lambda\left[1 + \frac{f(D)}{1 - F(D)}\right] - D$$

explicitly identifying all symbols in the equation except H, presumed the *estimated hidden demand* from the parent claim. For completeness, H should be identified explicitly.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bell ("Forecasting demand variation when there are stockouts," 2000; and "Adaptive Sales Forecasting with Many Stockouts," 1981; and "A New Procedure for the Distribution of Periodicals," 1978; referred to herein as "Bell"), in view of Artto and Pylkkanen ("An effective procedure for the distribution of magazines", 1999, herein "Artto").

Bell (1978, 1981, and 2000) discloses a method of forecasting expected demand for a periodical from historical sales data taking into account occurrences of sellouts, Bell improving on the old and well known "newsboy" optimization problem by optimizing expected demand estimation for an issue of a periodical distributed to multiple retailers, and later (2000) improving on the forecasting in the presence of large numbers of stockouts.

Artto (1999) discloses a method of forecasting expected demand for a periodical from historical sales data taking into account occurrences of stockouts, extending Bell by adding seasonality and causality to Bell's method of forecasting expected demand in the presence of stockouts.

Specifically, with respect to the invention as claimed:

Claim 1

Bell teaches determining a subset of sales values of the time series of sales values for the perishable consumer item at the outlet, the subset of sales values excluding the sales value at at least the occurrence of the sellout, the occurrence of the sellout being determined by comparing a sales value of the time series of sales values against a corresponding draw quantity of a time series of draw quantities to determine a forecasted mean demand value for the perishable consumer item at the outlet at the occurrence of the sellout (see Bell 1981, page 867: Bell teaches estimating demand, if no stockout occurred, by estimating mean demand using demand in a period, sales in the period, and stock on hand in the period, using simple smoothing equations over the non-stockout time series data for each time period. If, however, a stockout occurred in a period, Bell estimates demand for the stockout period using an approximation of the standard normal distribution (see equation (4) page 868 and preceding derivations. By the exclusion of periods of stockout from the estimation by smoothing of time series sales data over non-stockout periods, Bell teaches *a subset of sales values of the time series of sales values.*); however, Bell does not expressly teach *applying a statistical seasonal causal time series forecasting model of count data on the subset of sales values*; or *estimating the hidden demand at the occurrence of the sellout using a single parameter probability distribution with a parameter assuming the forecasted mean demand value*.

Artto teaches a method of forecasting expected demand for a periodical from historical sales data taking into account occurrences of sellouts, and variations in price

and seasonality (see pages 293 to 298, esp. Sections 3. and 5.), expressly extending Bell's methods as described above (see Arrto, page 293, 3rd paragraph; and Bell (2000 at page 359 right column). It would have been obvious to one of ordinary skill to apply a statistical seasonal causal time series forecasting model to the subset of sales values as this was found by Artto (page 295, last paragraph) to improve the forecasting models and thus produce more accurate forecasts of future demand for periodicals.

As for using a single parameter probability distribution with a parameter assuming the forecasted mean demand value, it was old and well known in the art that demand for periodicals is accurately modeled by the Poisson distribution (a single-parameter probability distribution) and that this distribution had particular application to forecasting demand in the presence of stockouts (see Wecker, "Predicting Demand from Sales Data in the Presence of Stockouts", 1978; and Conrad, "Sales Data and the Estimation of Demand," 1976, crediting P. M. Morse and G. E. Kimball with first applying, in 1951, the Poisson distribution to the "newsboy" problem). Further, Bell (1978, see page 429, 3rd paragraph under "*The probability distributions of demand*") expressly teaches that the "observed sales at many retail outlets were indistinguishable from drawings made from a Poisson distribution. Finally, it is noted, as a mathematical fact, that the Poisson distribution is a single-parameter distribution in which the mean and variance are equal to a single value λ (see "Poisson Distribution from Wolfram MathWorld"). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to estimate the hidden demand at the occurrence of the stockout using a single parameter probability distribution (e.g. the Poisson) with a parameter

assuming the forecasted mean demand value, because the Poisson distribution was known to provide an accurate model for predicting demand at the occurrence of a stockout of periodicals, thus leading to more accurate forecasts of expected demand.

Claim 2 recites the formula for calculating hidden demand using

$$H = \lambda\left[1 + \frac{f(D)}{1 - F(D)}\right] - D$$

As above in claim 1, Bell in view of Artto teaches or suggests using a single parameter probability distribution. The recited equation is a mere mathematical manipulation of the more general distribution equations in Bell (2000, equation (4)) and Artto (equation (7)) with the substitution of a single-parameter distribution having a mean and variance dependent on a single parameter (e.g. the Poisson distribution having a single-parameter λ. See also Wecker, page 1049, equation (3.5) for the generalized model of expected demand *E(X)* in the presence of a stockout.

The recited equation also differs from Bell and Arrto by subtracting a value *D*, the draw or stock sold at the time of the stock out. However, the expected demand *E(X)* from the equations of Bell and Artto for calculating expected demand in the presence of a stockout inherently incorporate hidden demand *H* into the expected demand *E(X)*, from the simple observation that the value *D* on the day of the stockout is the total sales on the day of the stockout, and thus expected sales *E(X)* would be *D* plus some unknown amount that could not be sold for lack of stock. Thus, the recited equation is merely an algebraic manipulation of the equation $E(X) = D + H$; that is, hidden demand *H* is the expected demand *E(X)* minus actual sales *D*, with the substitution of a single-parameter distribution into the equation taught by Bell, Arrto and Wecker.

The claimed equation thus expresses an obvious mathematical manipulation of the teachings of Bell and Arrto, already discussed above over the use of a single-parameter distribution (the Poisson) to estimate hidden demand at the occurrence of a stockout, for the stated advantage of providing more accurate forecasts of expected demand.

Claim 3

Bell teaches or suggests claim 1 as above, and further the subset of sales values excluding the sales value at all occurrences of the sellout (as above for the substantially similarly step of claim 1, see Bell 1981, page 867: Bell teaches estimating demand, if no stockout occurred, by estimating mean demand using demand in a period, sales in the period, and stock on hand in the period, using simple smoothing equations over the non-stockout time series data for each time period. If, however, a stockout occurred in a period, Bell estimates demand for the stockout period using an approximation of the standard normal distribution (see equation (4) page 868 and preceding derivations. By the exclusion of periods of stockout from the estimation by smoothing of time series sales data over non-stockout periods, Bell teaches *a subset of sales values of the time series of sales values*.).

Claims 4-7

Bell in view of Artto teaches or suggests calculating at least one performance metric on the basis of hidden demand adjusted sales data over an evaluation period...for comparing the efficacy of a recommended distribution policy to an actual distribution policy over the period...including at least one performance metric including

change in sales (see Bell, 2000, from page 361, "The Benefits of the Proposed Approach"; and Bell, 1978, from page 432, "The Optimal Number of Copies to Distribute"; and Bell, 1981, from page 869, "IMPLEMENTATION" and "SIMULATION" and especially Table 1: column "Change" row Sales).

Claim 8

Bell teaches specifically in the art of forecasting demand for printed media publications.

Claims 9-16, drawn to a system capable of executing the steps of the method in claims 1-8, recite substantially similar subject matter as in claims 1-8 above and are therefore rejected on the same basis as claims 1-8.

Claims 17-32 drawn to a method recite substantially similar subject matter as claims 1-8 above and are therefore rejected on the same basis as claims 1-8.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Conrad ("Sales data and the estimation of demand," 1976) is generally credited in the art (inventory management, periodically fulfillment) as being the first to analyze forecasted demand in the presence of stockouts, showing that unknown (hidden) demand is uncounted and therefore skews forecasts based on historical sales, however, Conrad cites Morse and Kimball (Methods of Operations Research, MIT Press, 1951) as recognizing the applicability of the Poisson Distribution to the newsboy problem.

Lau and Lau (1996) teach a method of estimating demand in the presence of stockouts where the quantity inventory is intentionally low forcing stockouts in a majority of time periods.

Hill (1999) teaches comparison of replenishment policies based on forecasted demand in the presence of "lost sales" (stockouts) including the use Poisson demand models.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dave Robertson whose telephone number is 571-272-8220. The examiner can normally be reached on 8:15am to 5:15pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on 571-272-6729. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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DCR
10/24/07

C. Michelle Tarae
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PRIMARY EXAMINER